

Measure It or Manage in the Dark: Practical Methods for Measuring Program Effectiveness

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Practical Environmental Performance Measurement



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The Response COMPASS



Reporting Compliance Rates With Greater Clarity

Compliance Rate for Compliance Monitoring Actions

State:

Program Area:

Time Period:

Is the time period the same for all data?

Gray highlights columns that are calculated and are not changed by the user.

ACTIVITIES							RESULTS					
Monitoring Program				Regulated Community			All Violations			Significant Violations		
column 1	column 2*	column 3	column 4	column 5	column 6	column 7	column 8*	column 9	column 10	column 11*	column 12	column 13
Sector, facility type or program focus	Number of Compliance Monitoring Actions (CMA)	Reason for CMA**	Methodology for CMA**	No. of facilities with CMAs conducted	No. of facilities in each category	Percent of monitored facilities: Col 5/Col 6	No. of facilities with violations	total number of violations	compliance rate (%) for monitored facilities: Col 8/Col 5	No. of facilities w/ significant violations	total number of significant violations	Significant Violation Non-compliance rate (%): Col 11/Col 5
Air Quality - High Impact	1,655			474	574	82.58	17		96.41	5		1.05
Air Quality - Low Impact	3,402			661	9,998	6.61	3		99.55	0		0.00
Radiation Machines	3,005			1,370	4,720	29.03	706		48.47	100		7.30
Radioactive Materials	328			328	982	33.40	92		71.95	8		2.44



Reporting Compliance Rates (1)

	ACTIVITIES		
	Monitoring Program		
column 1	column 2*	column 3	column 4
Sector, facility type or program focus	Number of Compliance Monitoring Actions (CMA)	Reason for CMA**	Methodology for CMA**
Air Quality - High Impact	1,655		
Air Quality - Low Impact	3,402		
Radiation Machines	3,005		
Radioactive Materials	328		

Reasons and Methodology

Reasons	Methodology
Suspected Problem	Whole Universe
Correction Check-Up	Random sample, statistical
Complaint Driven	Other subset of universe
Regularly Scheduled	
Geographic	Announced/Unannounced
Critical Environmental Area/Sensitive Ecosystem	

Reporting Compliance Rates (2)

column 1	Regulated Community		
	column 5	column 6	column 7
Sector, facility type or program focus	No. of facilities with CMAs conducted	No. of facilities in each category	Percent of monitored facilities: <i>Col 5/Col 6</i>
Air Quality - High Impact	474	574	82.58
Air Quality - Low Impact	661	9,998	6.61
Radiation Machines	1,370	4,720	29.03
Radioactive Materials	328	982	33.40

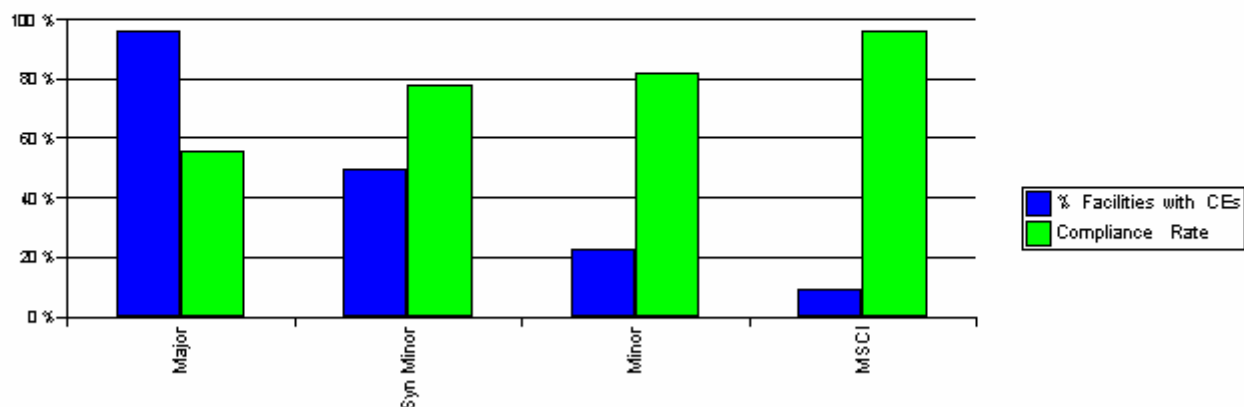
Reporting Compliance Rates (3)

RESULTS			
All Violations			
column 1	column 8*	column 9	column 10
Sector, facility type or program focus	No. of facilities with violations	total number of violations	compliance rate (%) for monitored facilities: Col 8/Col 5
Air Quality - High Impact	17		96.41
Air Quality - Low Impact	3		99.55
Radiation Machines	706		48.47
Radioactive Materials	92		71.95

Reporting Compliance Rates (4)

column 1	Significant Violations		
	<i>column 11*</i>	<i>column 12</i>	column 13
Sector, facility type or program focus	No. of facilities w/ significant violations	total number of significant violations	Significant Violation Non-compliance rate (%): Col 11/Col 5
Air Quality - High Impact	5		1.05
Air Quality - Low Impact	0		0.00
Radiation Machines	100		7.30
Radioactive Materials	8		2.44

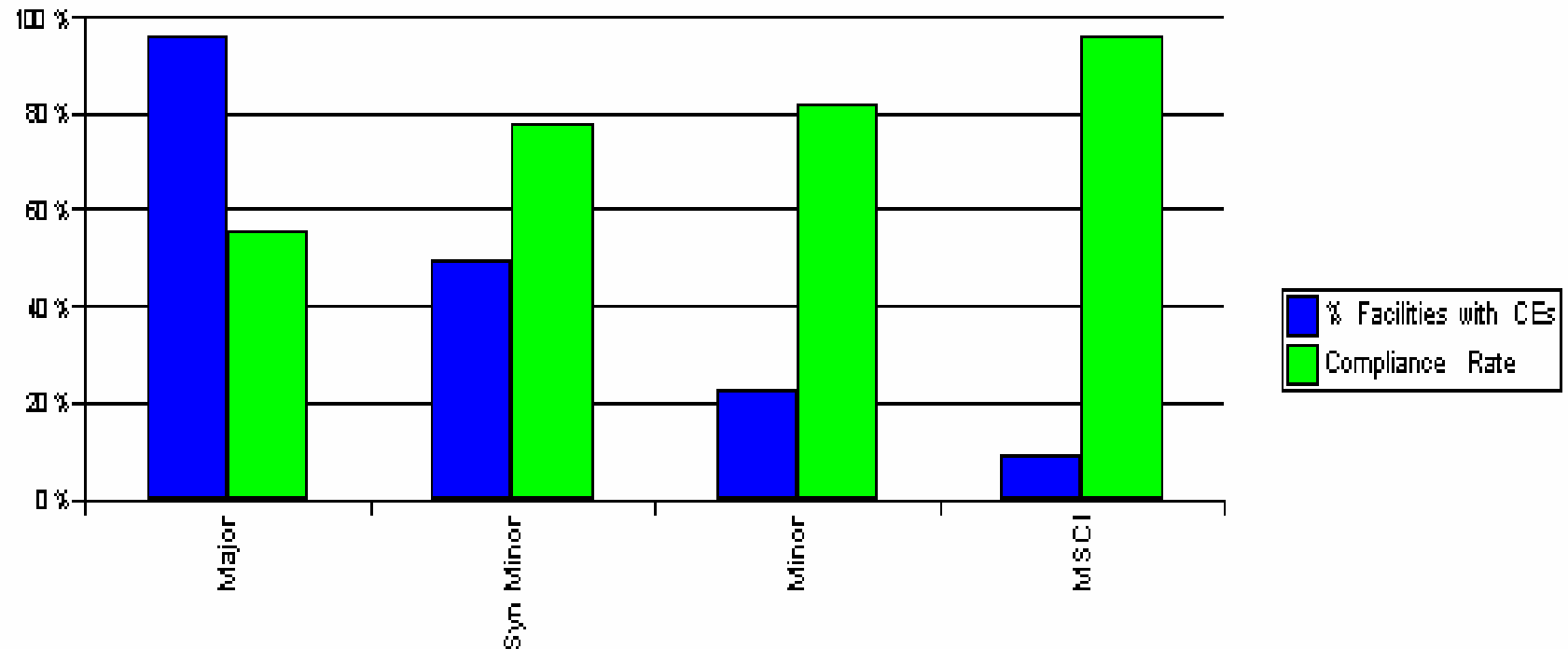
**New Jersey Department of Environmental Protection - DRAFT -
Compliance Rate for Air Program Based on Inspections Conducted in 2002**



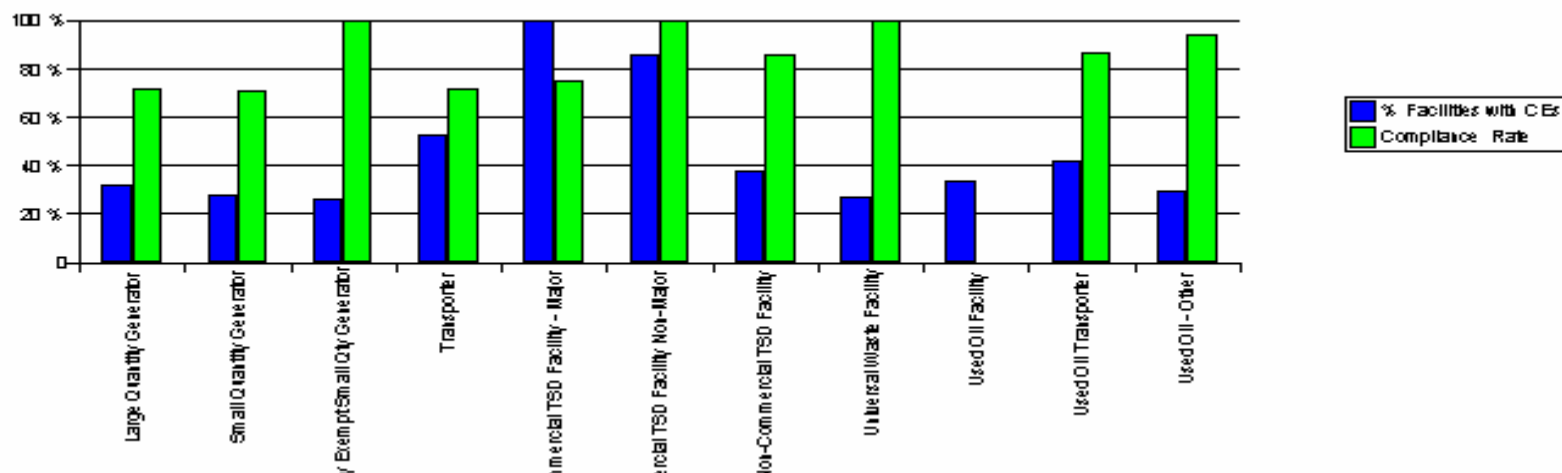
Facility Size	Compliance Evaluations	Facilities with CEs	All Facilities	% Facilities with CEs	Facilities with violations	Violations	Compliance Rate	Facilities with High Priority Violations	High Priority Violation Non-Compliance Rate
Major	1,904	380	396	96.0 %	169	1,408	55.5 %	29	7.6 %
Syn Minor	709	479	968	49.5 %	106	443	77.9 %	2	0.4 %
Minor	905	914	4,081	22.4 %	165	631	81.9 %	2	0.2 %
MSCI	505	1,210	13,484	9.0 %	47	99	96.1 %		

NJ DEP CR Air - DRAFT '02

New Jersey Department of Environmental Protection - DRAFT -
Compliance Rate for Air Program Based on Inspections Conducted in 2002



NJ DEP Comp. Rate for Haz. Waste DRAFT CY2002

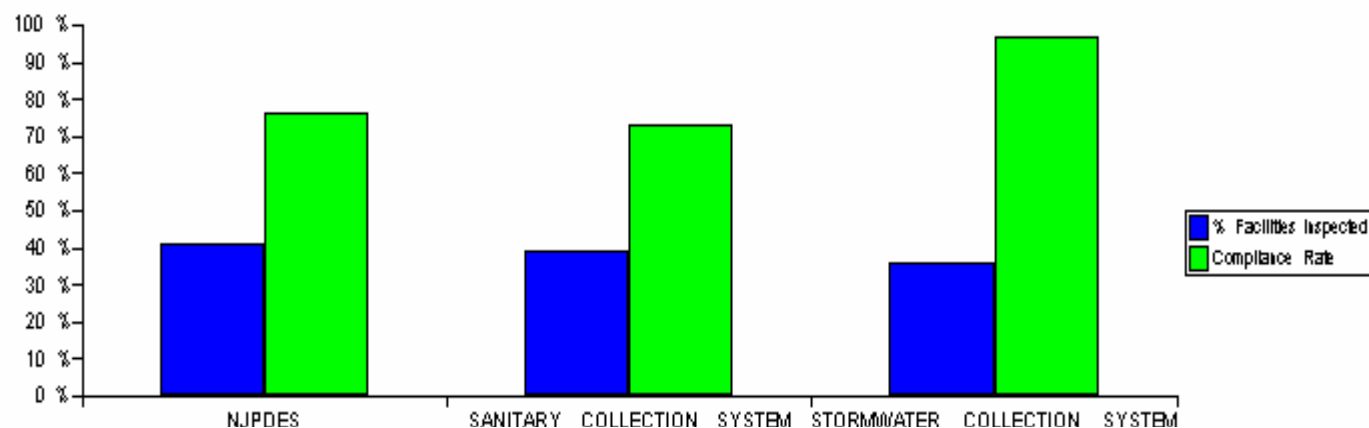


Hazardous Waste Facility Category	Compliance Evaluations	Facilities with CEs	All Facilities	% of Facilities Inspected	Facilities with Violations	# of Violations	Compliance Rate	Facilities with High Priority Violations	High Priority Violation Non-Compliance Rate
Large Quantity Generator	147	129	400	32 %	37	134	71 %	0	
Small Quantity Generator	133	126	456	28 %	37	112	71 %	0	
Conditionally Exempt Small Qty Generator	187	187	709	26 %			100 %	0	
Transporter	199	74	141	52 %	21	42	72 %	0	
Commercial TSD Facility - Major	163	4	4	100 %	1	2	75 %	0	
Commercial TSD Facility Non-Major	67	6	7	86 %			100 %	0	
Non-Commercial TSD Facility	22	21	56	38 %	3	6	86 %	0	
Universal Waste Facility	9	9	33	27 %			100 %	0	

Hazardous Waste Facility Category	Compliance Evaluations	Facilities with CEs	All Facilities	% of Facilities Inspected	Facilities with Violations	# of Violations	Compliance Rate	Facilities with High Priority Violations	High Priority Violation Non-Compliance Rate
Used Oil Facility	20	2	6	33 %	2	2	0 %	0	
Used Oil Transporter	61	15	36	42 %	2	2	87 %	0	
Used Oil - Other	196	181	614	29 %	11	13	94 %	0	

NJ DEP Comp. Rate Water Quality – DRAFT

CY 2002



Water Quality PI Type	Compliance Evaluations	Facilities with CEs	All Facilities	% of Facilities Inspected	Facilities with Violations	# of Violations	Compliance Rate	Facilities with Serious Violations	Serious Violation Non-Compliance Rate
NJPDES	2,059	1,830	4,481	41 %	430	1,770	77 %	1	0.02 %
SANITARY COLLECTION SYSTEM	161	133	341	39 %	36	157	73 %	0	0 %
STORMWATER COLLECTION SYSTEM	36	33	92	36 %	1	6	97 %	0	0 %

NJ Comp. Rates by SIC in Air Program

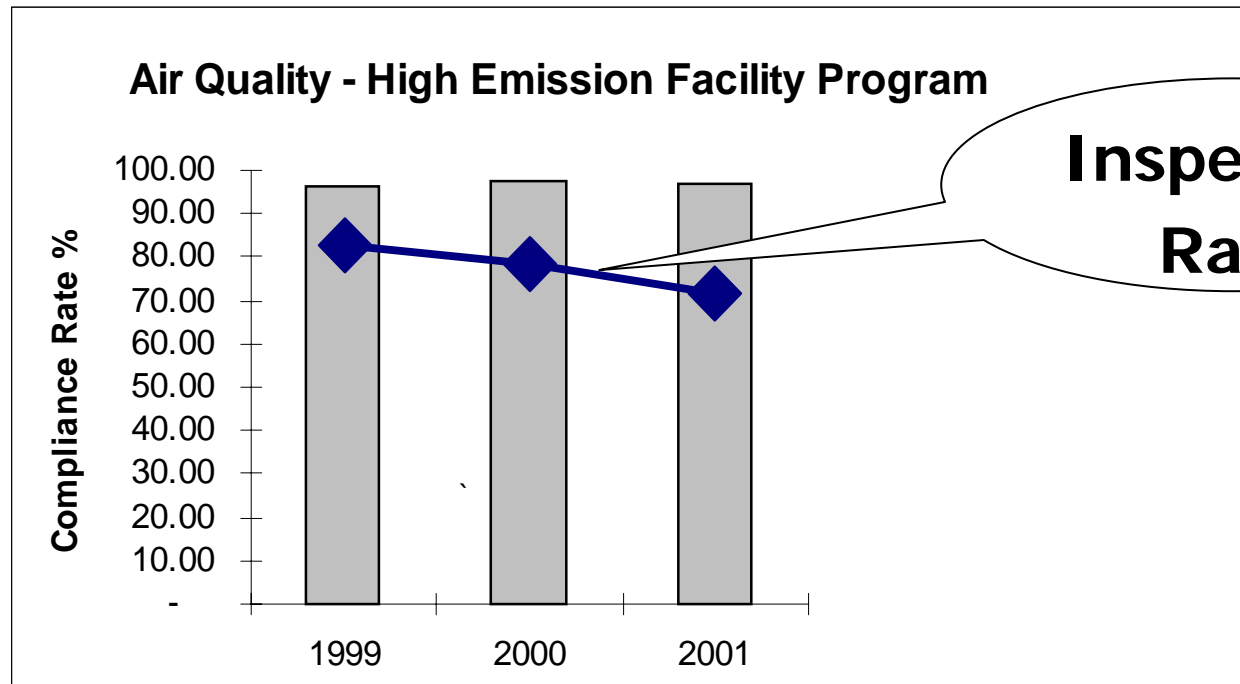
2002-- DRAFT

SIC Description	SIC	Compliance Evaluations	Facilities with CEs	All Facilities	% Facilities with CEs	Facilities with Violations	# of Violations	Compliance Rate	Facilities with High Priority Violations	HPV Non-Comp Rate
Electric and Other Services Combined	4931	117	12	8	100.0 %	8	26	33 %	2	17 %
Gypsum Products	3275	8	3	3	100.0 %	2	4	33 %	1	33 %
Special Warehousing and Storage, NEC	4228	34	5	3	100.0 %	3	15	40 %	2	40 %
Sewerage Systems	4952	77	12	13	92.3 %	7	57	42 %		
Petroleum Refining	2911	272	12	7	100.0 %	7	463	42 %	5	42 %
Colleges, Universities, and Professional	8221	43	7	8	87.5 %	4	25	43 %		
Industrial Organic Chemicals, NEC	2869	83	19	17	100.0 %	10	51	47 %	1	5 %
Converted Paper Products, NEC	2649	2	2	3	66.7 %	1	8	50 %		
Industrial Inorganic Chemicals, NEC	2819	18	6	7	85.7 %	3	13	50 %	1	17 %

**New Jersey Department of Environmental Protection - DRAFT -
Compliance Rate for Facilities that have not applied for a new permit or modification since
July 1997**

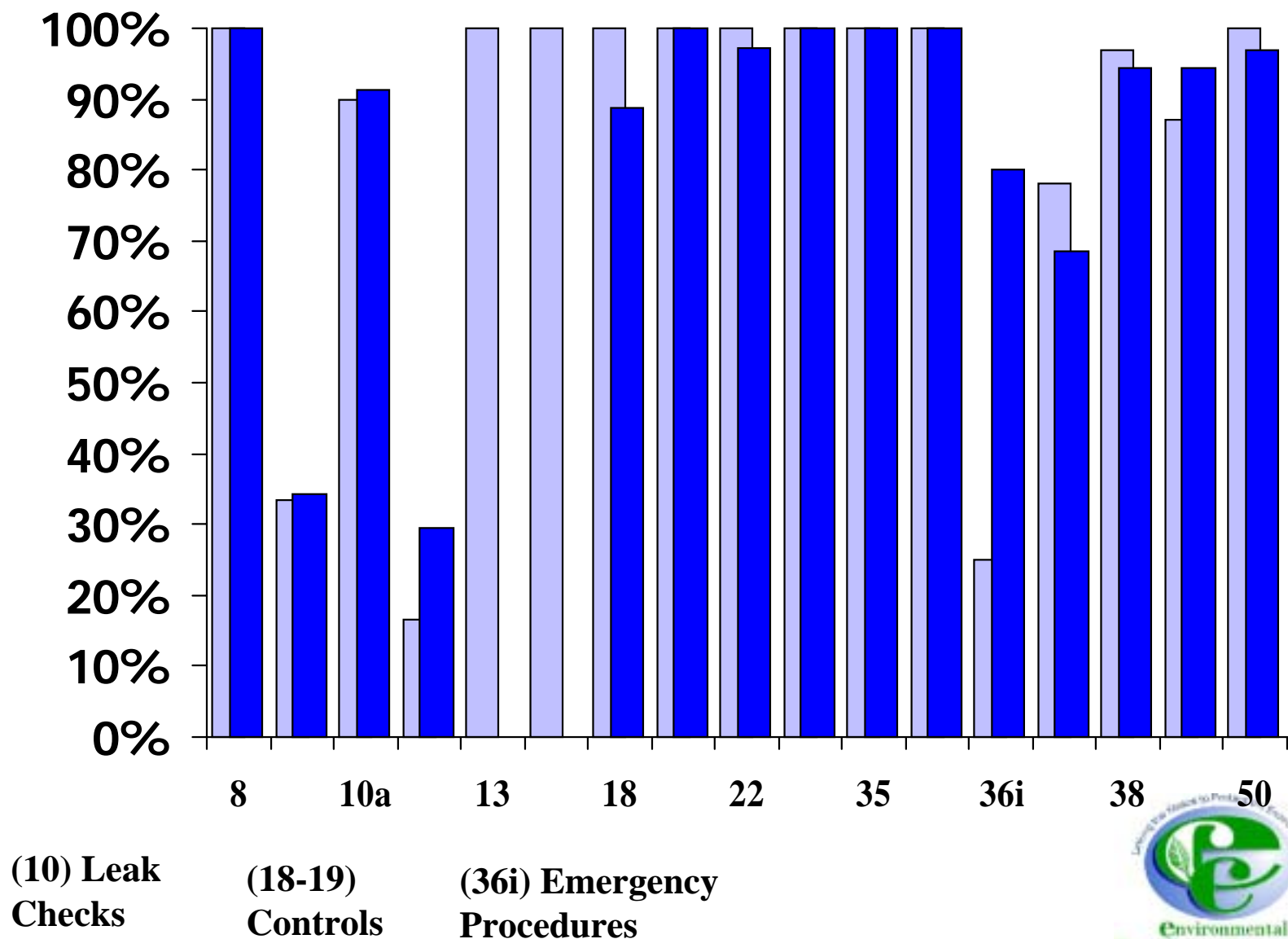
Facility Size	Compliance Evaluations	Facilities with Compliance Evaluations	Total Facilities	% of Facilities where Comp Evals Conducted	Facilities with Violations	Violations	Compliance Rate for Facilities with Compliance Evaluations
Major	57	11	23	48 %	5	20	54.5 %
Synthetic Minor	75	32	108	30 %	9	16	71.9 %
Minor	154	59	893	7 %	19	71	67.8 %
Total	286	102	1,024	10 %	33	107	67.6 %

Multi-year Performance Trends



Learning from Experience: MA ERP Self-Audit Data

1997 & 1998



1992

2000

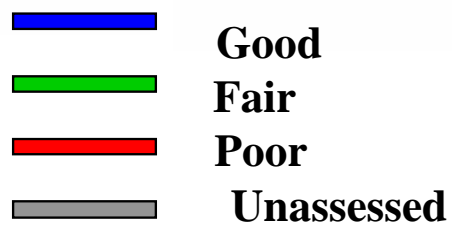
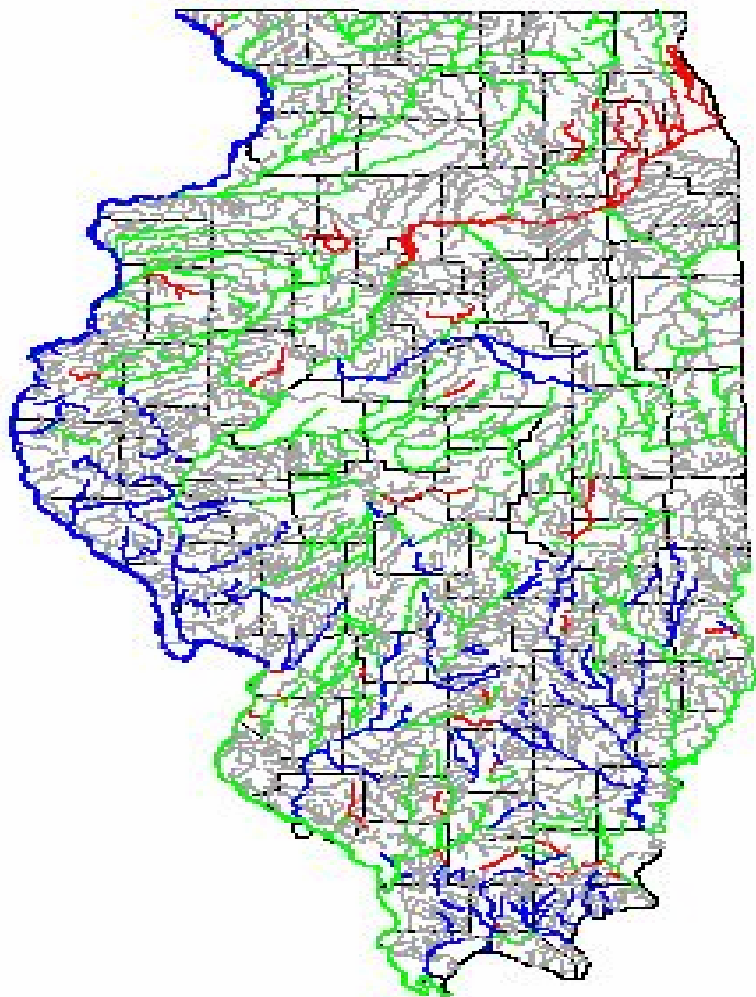
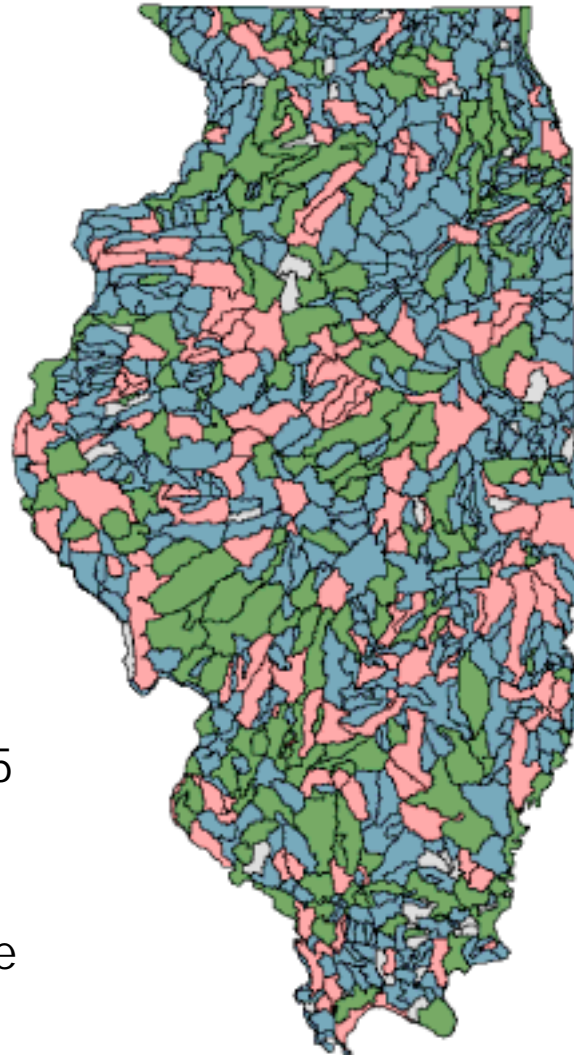
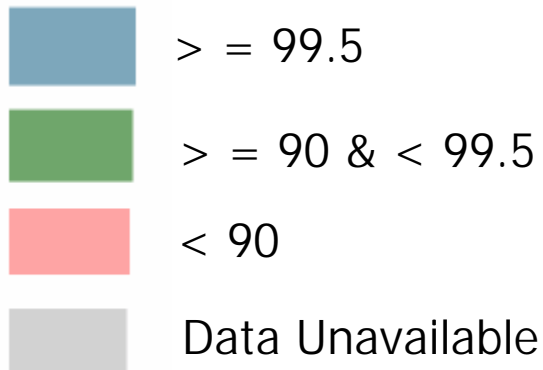


Figure 20 – Compliance Information by Watershed

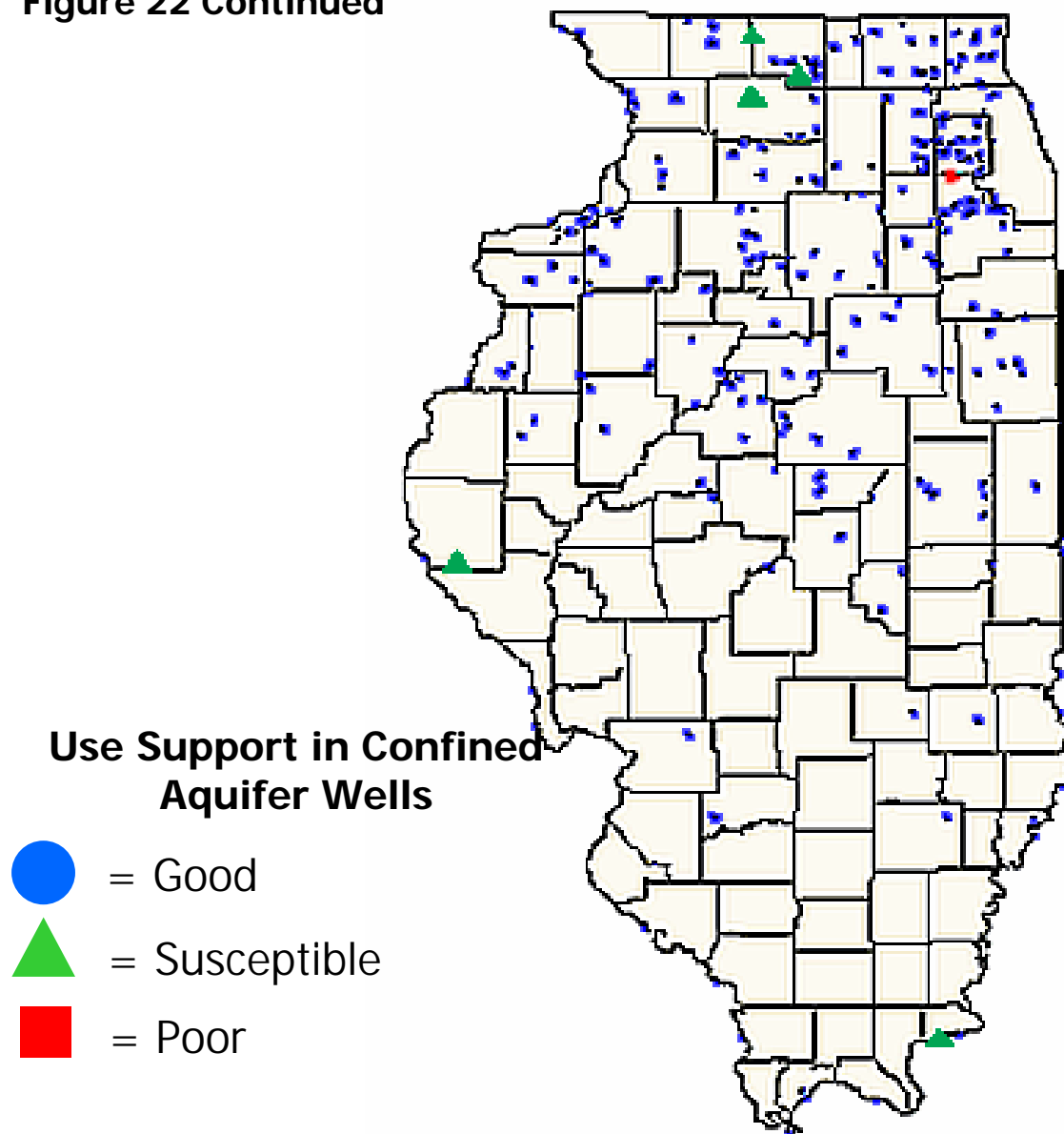
Percent Compliant Load By Watershed

Percent Compliant Load



Percent compliant load is based on available 2000 Discharge Monitoring Report data for all permitted facilities.

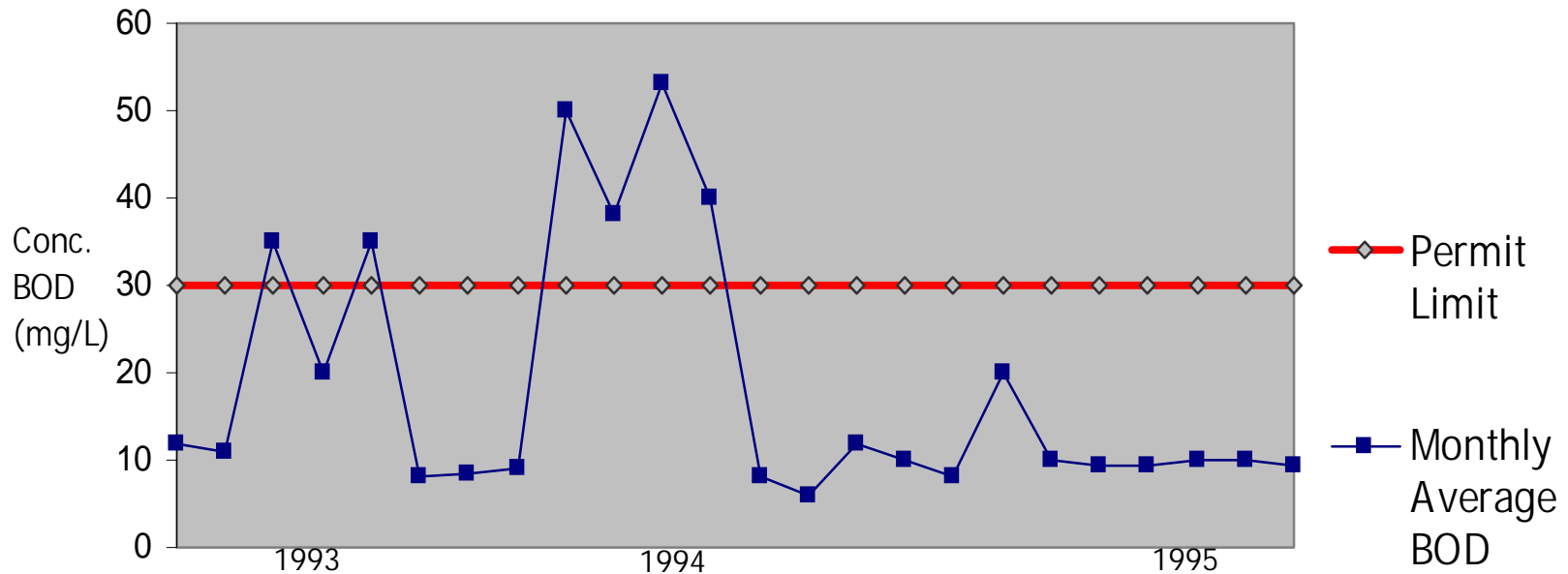
Figure 22 Continued



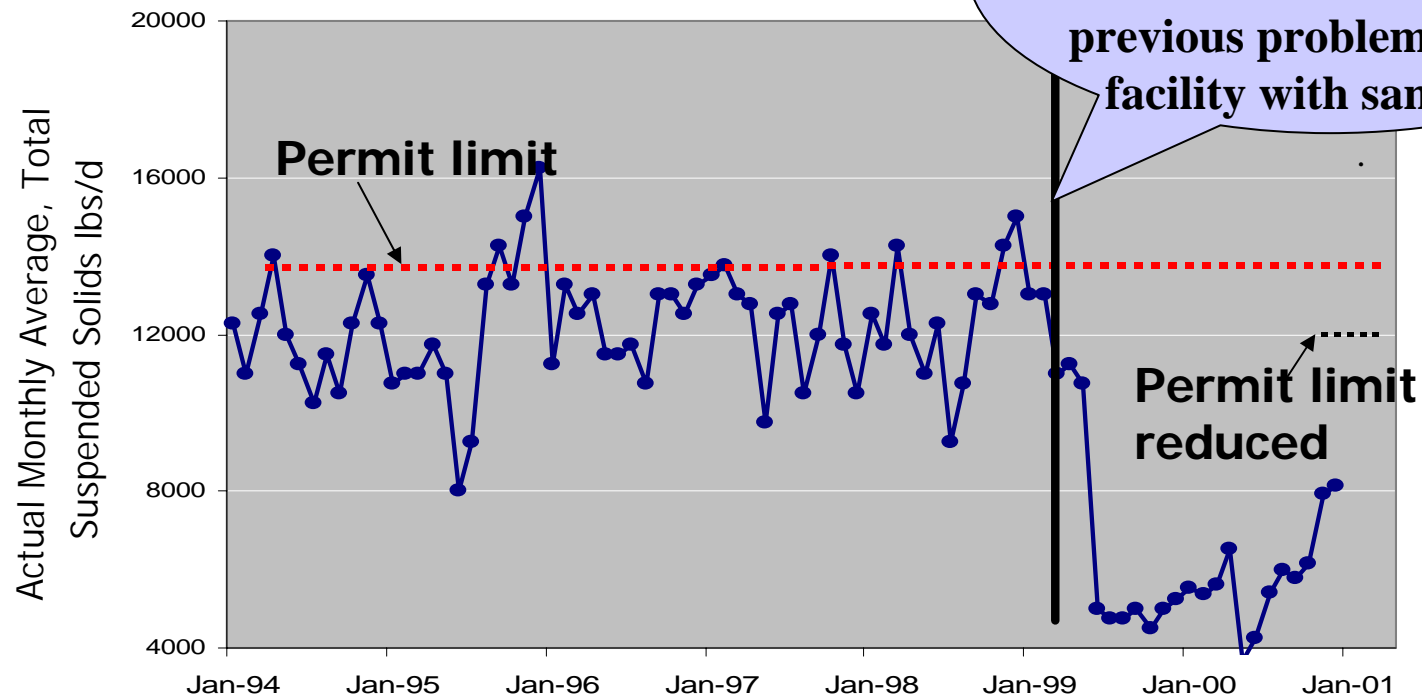
Mapping
links
compliance
information
and human
exposure.

Identifying Best and Worst Performers and Assessing Non-Compliance

Average Monthly Effluent BOD for a Single Facility

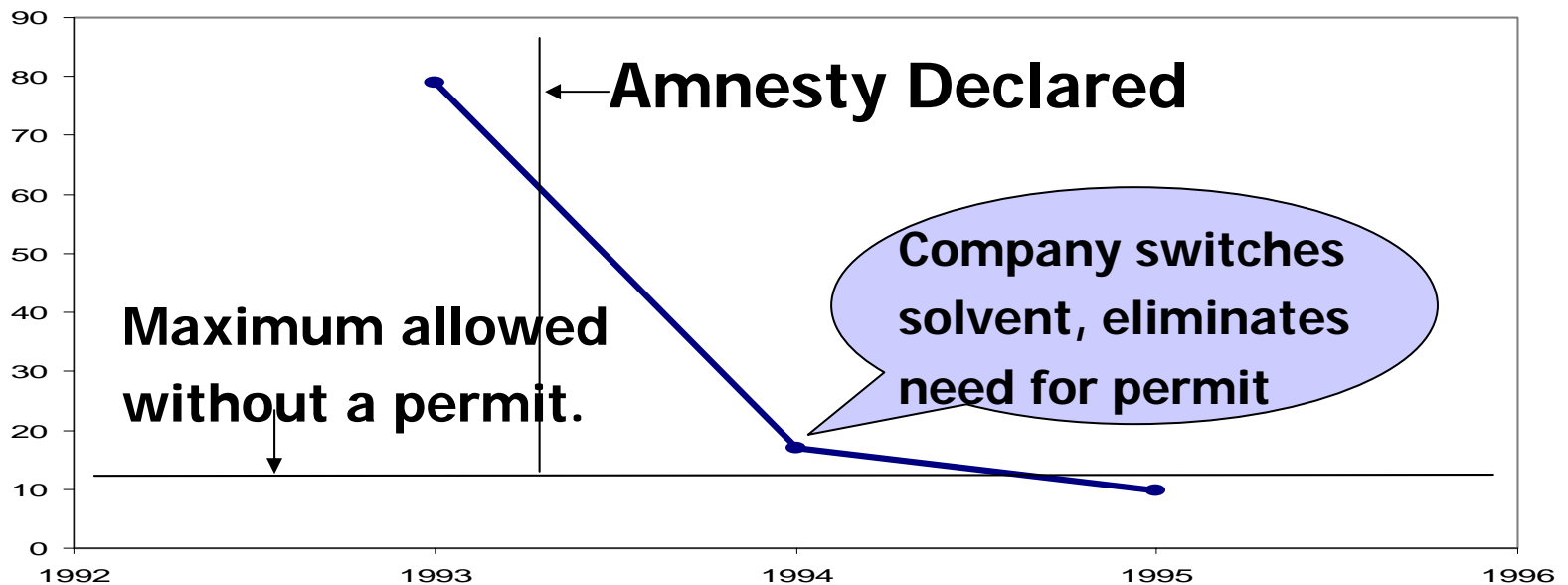


Tracking Facility-Specific Perf. and Agency Action Detects Program Effects



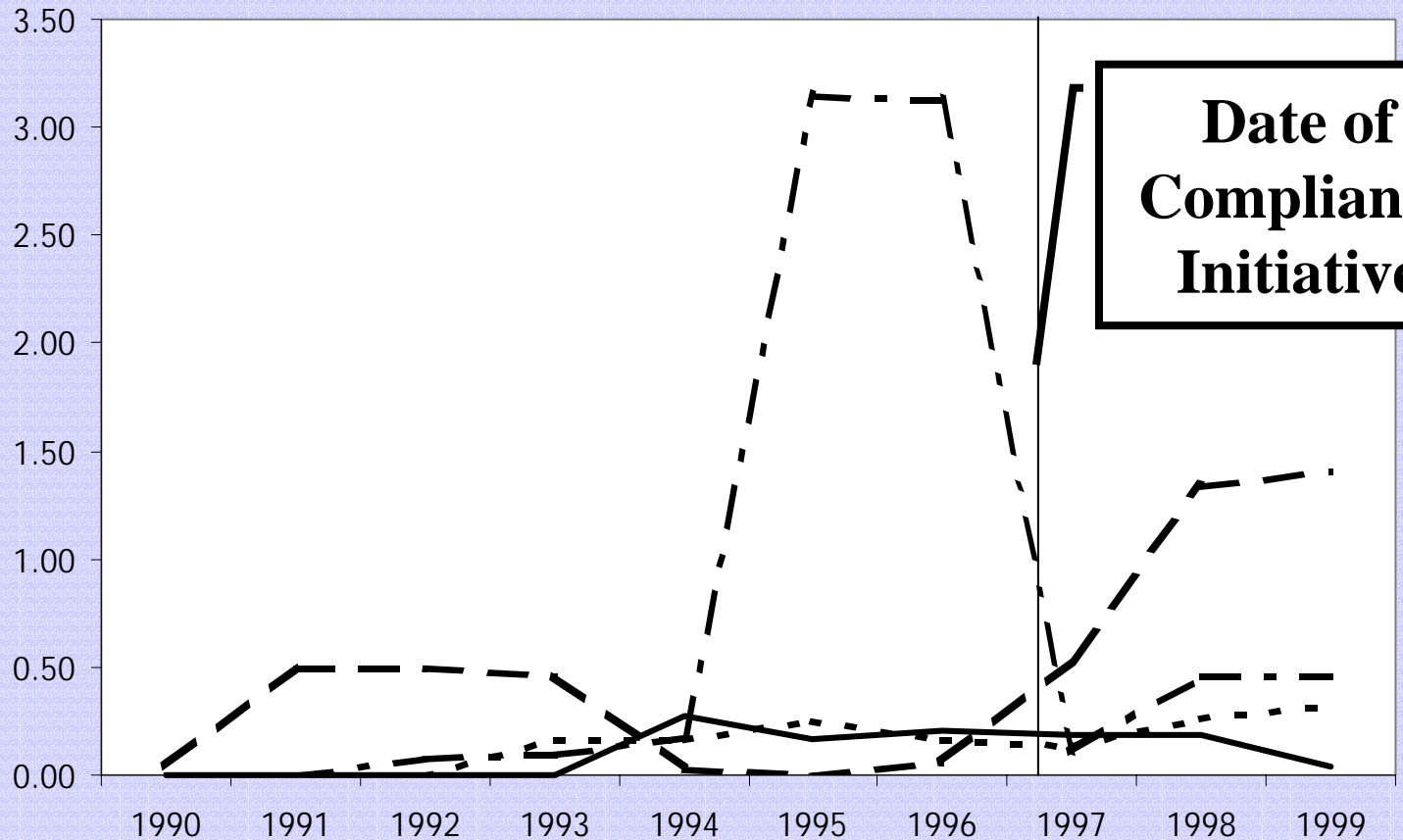
Effect of an Agency Action

Combining Trend Data with Dates of Agency Actions



Emissions Before and After Agency Action

Tons/year CO Emissions



Outcome-focused Goals and Measures ...

- ***Improve Outcomes***
 - **Motivate**
 - **Find Problems**
 - **Find Solutions**
- ***Strengthen Democracy***

Time and Place-Specific Goal

- **Where: Lower Charles River**
- **When: 10 years**
- **How much: Swimmable**

**Monthly Measures --
37 locations on river**

Charles River in Boston

- Swimmable 19 percent of time in 1995 cf. to 69 percent in 2001
- Boatable 39 percent in 1995 cf. to 87 percent of time in 2001

Highly Visible Goal and Measurement

Invite media attention

- Head of the Charles Regatta
- 300 K spectators
- Front page story

Annual report card

- Earth Day -- Predictable
- News window
- Easy to understand

Diagnostic Measurement:

When and Where problems arise

Description	Town	River Mile	2/15/00	3/21/00	5/16/00	6/20/00
Central Street Bridge	Milford	3.5	1100	380	120	240
Discharge Pipe @ Central Street	Milford	3.5	1470	2100	3400	3000
2d Discharge Pipe @ Central Street	Milford	3.5		<10	260	840
Mellen St. Bridge	Bellingham	5.9		490	140	170
Rt. 126, N. Main	Bellingham	9.0	340	10	120	70
Maple Street Bridge	Bellingham	12.9	70	<10	60	30
Shaw St. Bridge	Franklin	16.5	280	10	90	60
Populatic Pond Boat Launch	Norfolk	19.9		30	40	

Source: Charles River Watershed Association website



Segmentation to Control for Background Suggests Tailored Interventions

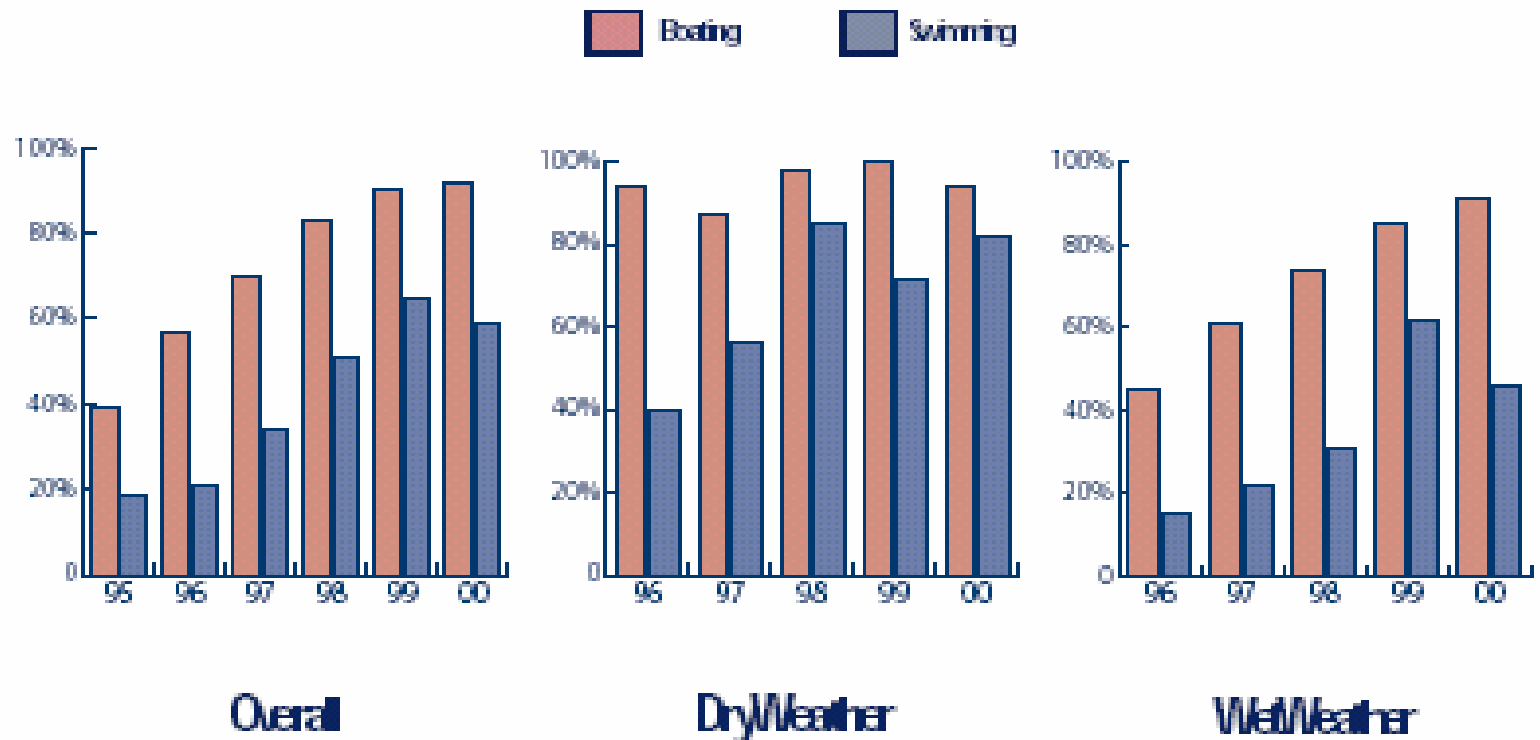
Charles River Bacteria Data - % of Time Water Quality Standards Attained

	1995	1996	1997	1998
Overall				
<i>Boating</i>	39	57	70	83
<i>Swimming</i>	19	21	34	51
Dry				
<i>Boating</i>		94	87	98
<i>Swimming</i>		40	56	85
Wet				
<i>Boating</i>		45	61	74
<i>Swimming</i>		15	22	31

Overview of Progress

Charles River Bacteria Data

Percentage Water Quality Standards Attained



Report Card 2000

1995	D
1996	C-
1997	C
1998	B-
1999	B
2000	B
2005 Goal	A

Town Grades

- Reward the best
- Motivate the back of the pack
- Change local dynamics

Flags at Boat Houses – Pt. of Use

- Blue – safe
- Red - unsafe

Measures: Multiple Uses and Users

- Monthly measures to find problems (patterns and unexpected)
- Measures to find solutions
- Segmented measures: tailor solutions
- Measures to motivate
cf. goals, peers, past
- Measures to inform choices

Measurement Characteristics

- Frequent – 37 monitors along 80 mile stretch of river
- Fresh – posted within a week
- Credible – generated by a third-party, checked by others' monitoring
- Readily available – on Internet, at point of use

Interactive Examination of Lessons

- Public posting of measures
- Quarterly meetings with towns and others
- Interactive inquiry
- Avoiding the gotcha mentality

Enlist and Engage!

External to organization

- **Clarify expectations,**
- **Enlist assistance and expertise,**
- **Shared objectives,**
- **Communicate with citizens,**
- **Motivate,**
- **Benchmark and learn.**

Keys to Success

- **Fresh and frequent measurement**
- **Analysis: find patterns and anomalies**
- **Meet with measures in hand to discuss and brainstorm.**
- **Slice it and dice it. Experiment. Learn.**
- **Agree on/set and stay focused on meeting the goal**

Use it or Useless: Measurement helps you....

- **Learn**
 - **Find Problems**
 - **Find Successes**
- **Motivate**
- **Assess Progress**
- **Inform Choices**